

REMARKS

Claims 1 through 25 are pending in this Application. Claims 1, 3, 4, 8 through 10, 13 through 15, 21 and 24 have been amended. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, Fig. 2C and the related discussion thereof in the written description of the specification. Applicants note that typographical oversights have been corrected in claims 1, 3, 4, 8, 9, 10, 13, 14, 15, and that claims 21 and 24, indicated allowable, have been placed in independent form. Applicants submit that the present Amendment does not generate any new matter issue.

Claim objections.

The Examiner objected to claims 3, 4, 13 and 14 identifying an informality. By the present Amendment the identified informality has been addressed, thereby overcoming the stated bases for the claim objections. Accordingly, withdrawal of the objections to claims 3, 4, 13 and 14 is solicited.

Claims 1, 4, 10, 14, 20, 22, 23 and 25 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al.

In the statement of the rejection the Examiner concluded that one having ordinary skill in the art would have been motivated to form the interconnect structure of Nogami et al. by forming a beta-Ta layer on the inlaid copper and forming an alpha-Ta layer on the titanium nitride layer in view of Seet et al. This rejection is traversed.

Independent claims 1 and 10 have been clarified by reciting that the capping layer is on the entire upper surface of the inlaid copper or copper alloy. No such structure is disclosed by Nogami et al. This is because the composite layer pointed to by the Examiner is **not** a capping layer, but an interconnect between copper and aluminum. Clearly, the composite capping layer identified by reference characters 13, 14, 15 and 16 in Fig. 1 of Nogami et al. is **not** formed on the entire upper surface of the inlaid copper. Nor is there any reason apparent from the record why one having ordinary skill in the art would have **deviated** from the teachings of Nogami et al. and have been led to form the composite capping layer over the entire upper surface of the inlaid copper, apart from Applicants' disclosure. Applicants' disclosure is, of course, forbidden territory upon which the Examiner may excavate for the requisite motivational element. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).

The secondary reference to Seet et al. does not cure the argued deficiencies of Nogami et al., because Seet et al. have nothing to do with an interconnection between copper and aluminum. Accordingly, even if the structure and method of Nogami et al. are modified as suggested by the Examiner, and Applicants do not agree that the requisite fact-based motivation has been established, the claimed invention would not result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Applicants, therefore, submit that the imposed rejection of claims 1, 4, 10, 14, 20, 22, 23 and 25 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 2, 3, 5 through 8, 11 through 13 and 16 through 18 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al. and Sudijono et al.

In the statement of the rejection the Examiner concluded that one having ordinary skill in the art would have been motivated to form the composite layer of Nogami et al. in a recess in the inlaid copper in view of Sudijono et al. This rejection is traversed.

Firstly, claims 2, 3 and 5 through 10 depend from independent claim 1, and claims 11 through 13 and 16 through 18 depend from independent claim 10. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claims 1 and 10 under 35 U.S.C. § 103 for obviousness over Nogami et al. in view of Seet et al. The additional reference to Sudijono et al. does not cure the previous argued deficiencies in the attempted combination of Nagami et al. and Seet et al.

Furthermore, Applicants separately argue the patentability of claims 2, 3, 5 through 8, 11 through 13 and 16 through 18. As previously pointed out, Nogami et al. **do not form a capping layer**, as that term would have been understood by one having ordinary skill in the art, on any inlaid copper. Nogami et al. merely form an interconnection between copper and aluminum. Element 16 in the Fig. 8 structure of Sudijono et al. is **not**, repeat **not**, an interconnect between copper and aluminum as is the composite layer of Nogami et al. relied upon by the Examiner. Accordingly, regardless of what Sudijono et al. may or may not teach about inlaying a capping layer, such a teaching would not apply to the interconnect of Nogami et al. It makes no sense to imbed the composite interconnect of Nogami et al.

Again, the Examiner has not factually established that one having ordinary skill in the art would have recognized the composite interconnect layer of Nogami et al. functions as a capping

layer, and it cannot because it is not intended to perform that function and is not formed across the upper surface of the inlaid copper. Accordingly, what may or may not be conventional practice with respect to capping layers has **no applicability** to the interconnect structure of Nogami et al.

Applicants, therefore, submit that the imposed rejection of claims 2, 3, 5 through 8, 11 through 13 and 16 through 18 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al. and Sudijono et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 9 and 19 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al., Sudijono et al. and Gupta et al.

In the statement of the rejection the Examiner concluded that one having ordinary skill in the art would have been motivated to provide a second composite capping layer over the inlaid copper of the structure disclosed by Nogami et al. in view of Gupta et al. This rejection is traversed.

Firstly, claims 9 and 19 depend from independent claims 1 and 10, respectively. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claims 1 and 10 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al. The additional references to Sudijono et al. and Gupta et al. do not cure the previously argued deficiencies in the attempted combination of Nogami et al. and Seet et al.

Further, Applicants separately argue the patentability of claims 9 and 19. The Examiner's proposed modification of Nogami et al. would render the entire invention of Nogami et al. **inoperative**. Nogami et al. seek to interconnect copper and aluminum. Nogami et al. do **not**

seek to interconnect copper and copper which is what Gupta et al. do. The Examiner's arbitrary surgical extraction of a portion of Gupta et al., relating to copper-copper interconnects and impressing that surgically extracted section into the structure of Nogami et al. which relates to a copper-aluminum interconnect, is without any factual basis or technological rationale.

Based upon the foregoing Applicants submit that the imposed rejection of claims 9 and 19 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al., Sudijono et al. and Gupta et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claim 15 was rejected under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al., Sudijono et al. and Lopatin et al.

This rejection is traversed.

Claim 15 depends from independent claim 10. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 10 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al. The additional references to Sudijono et al. and Lopatin et al. do not cure the previously argued deficiencies in the attempted combination of Nogami et al. and Seet et al.

Applicants, therefore, submit that the imposed rejection of claim 15 under 35 U.S.C. § 103 for obviousness predicated upon Nogami et al. in view of Seet et al., Sudijono et al. and Lopatin et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Applicants acknowledge, with appreciation, the Examiner's indication that claims 21 and 24 would be allowed upon overcoming the imposed rejections under the second paragraph of 35

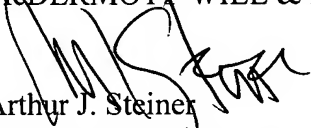
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U.S.C. § 112. Applicants note that the Examiner did not impose a rejection under the second paragraph of 35 U.S.C. § 112. Presumably, the Examiner intended to refer to the objection to the claims, which was overcome. Based upon the foregoing it should be apparent that not only the imposed objection but the imposed rejections have been overcome, and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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